CONSTRUCTION SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE

WATER WELL

SCOPE

This item consists of all materials, equipment, and labor necessary for the installation of a well. The construction operations shall be done in such a manner that erosion, air, water, and noise pollution will be minimized and held within legal limits as specified by state regulations.

INSTALLATION REQUIREMENTS

Alignment

Drilled wells shall be round, plumb, and aligned so as to permit satisfactory installation and operation of a pump of the proposed size and type to the greatest anticipated depth of setting.

Casing Installation

In consolidated formations, the casing shall extend from the ground surface through the overburden material to an elevation at least 2 feet into the consolidated foundation.

In unconsolidated formations, the casing shall extend from the ground to the screen.

For artesian aquifers, the casing shall be sealed into the overlaying impermeable formations so as to retain the artesian pressure.

If a water-bearing formation containing water of poor quality is penetrated, the formation shall be sealed off to prevent infiltration of poor-quality water into the well and the developed aquifer.

Developing

The well shall be developed until it has stopped producing detrimental quantities of solid particles when the continuous discharge rate is approximately 20 percent greater than the anticipated normal production rate.

Protection

All wells, and the area around the wells, shall be constructed at a sufficient height above the adjacent ground surface to exclude the entrance of surface water.

Wells shall have the annular space outside the casing filled with a watertight cement grout or clay having similar sealing properties from the surface to a minimum of 10 feet below the ground surface. The casing shall be surrounded at the ground surface by a 4-inch concrete slab extending at least 2 feet in all directions. A sanitary well seal shall be installed at the top of the well casing to prevent the entrance of contaminated water or other objectionable material.

Pressure Tank.

Unless otherwise approved, all wells shall be constructed utilizing a pressure tank of sufficient size to extend the life of the pump.

Power Source.

Electrical components and installations shall meet the requirements of the National Electrical Code (NEC) and state and local codes for outdoor installation. All electrical wiring shall be in a conduit. Installation shall be certified in writing by a qualified licensed electrician. Wherever installation could be classified as a hazardous location, specific conformance to NEC Article 500 will be met.

Gravel Pack

If gravel packing is used, it shall be of the specified gradation and thickness and shall be carefully placed to prevent segregation and bridging. Gravel pack materials shall extend a minimum of 10 feet above the top of the perforated or screened section and shall

extend through the length of the water-bearing formation.

Materials

Casing materials may be pipe made of steel, copper, plastic, fiberglass, concrete, or other similar materials of equivalent strength and durability.
Steel pipe, copper, reinforced plastic mortar, or plastic pipe may be used for well casings in drilled wells. Only steel pipe shall be used for driven wells. Plastic casing shall be NSF approved for transport of potable water supplies if the water will be used for human consumption. Used steel pipe may be used for well casing, provided that it is of good quality and has a wall thickness equal to or greater than Schedule 40. Plastic casing shall be acrylonitrile-butadiene-styrene (ABS), or polyvinyl chloride (PVC), or styrene-rubber (SR) conforming to ASTM F 480.

Concrete well casings shall be reinforced and shall meet or exceed the requirements of ASTM C 76. The minimum 28-day compressive strength shall be 4,000 psi.

RPM well casings shall equal or exceed the requirements of ASTM Specification D 3517.

Steel well casings shall equal or exceed the requirements of ASTM A 589.

Joints

Joints for well casing shall have adequate strength to carry the load due to the casing length and still be watertight or shall be mechanically supported during the installation process to maintain joint integrity. Such mechanically supported casings shall terminate on firm material that can adequately support the casing.

Joints for plastic well casing pipe may be solvent cement or threaded couplings and shall have sufficient strength to carry the load due to the casing length and still remain watertight. Solvent cement must meet the requirements of ASTM specifications appropriate for the material used.

Workmanship

The well casing pipe, couplings, and screens shall be homogeneous throughout and shall be free from visible cracks, holes, foreign materials, or other injurious defects. The well casing pipe, couplings, and screens shall be as uniform in color, density, and other physical properties as is commercially possible.

Markings

The well casing pipe shall be marked according to the ASTM specification for the material used.

Certification

Markings on material identifying the manufacturer and indicating compliance with appropriate specifications can be accepted as evidence that the material meets the requirements of this standard. If the material does not bear these markings, the manufacturer can certify that it complies with the requirements of this standard. Tests supporting this certification shall be furnished if requested by the state conservation engineer.